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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Yoshito Nakanishi

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PEARNE & GORDON LLP
1801 EAST 9TH STREET
SUITE 1200
CLEVELAND, OH 44114-3108

EXAMINER

ROJAS, BERNARD

ART UNIT

PAPER NUMBER

2832

NOTIFICATION DATE

DELIVERY MODE

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ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patdocket@pearne.com
dchervenak@pearne.com

Office Action Summary	Application No. 10/592,988	Applicant(s) NAKANISHI, YOSHITO	
	Examiner BERNARD ROJAS	Art Unit 2832	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-10, 12, 13, 15, 16 and 21 is/are rejected.
- 7) ☒ Claim(s) 11, 14, 17-20 and 22 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>05192006</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear what is being referred to by "the electromechanical switch" in line 9 of the claim, is it the first electromechanical switch or the second electromechanical switch of the combination of switches? For examination purposes, this will be interpreted as an electromechanical switch that is made out of the first and second electromechanical switches.

Claim 21 recites the limitation "the first fixed electrode" in lines 12 and 15 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

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only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, 4, 5, 9, 10, 12, 13, 16 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Hopcroft [US 6,621,387].

Claim 1, as best understood, Hopcroft discloses an electromechanical switch, comprising: a first electromechanical switch [106] that is adapted to turn on and off based on a displacement of a first beam which is restorable by a relatively weak spring force; and a second electromechanical switch [108] that is adapted to turn on and off based on a displacement of a second beam which is restorable by a relatively strong spring force, wherein in an initial condition, the electromechanical switch is brought into an off-state in which the first electromechanical switch is off and the second electromechanical switch is on [col. 8 lines 33-46]. It has been held that the recitation that the element is "adapted to" perform a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. In re Hutchinson, 69 USPQ 1338.

Claim 2, Hopcroft discloses the electromechanical switch according to claim 1, wherein the first beam [106] is displaced from the initial condition by one of application and cancellation of a driving force such that the first electromechanical switch is tuned on, thereby bring the electromechanical switch into an on-state [col. 8 lines 23-32].

Claim 4, Hopcroft discloses the electromechanical switch according to claim 1, wherein the second beam starts to perform natural vibrations by turning off the second electromechanical switch; and wherein the second beam is latched by one of application and cancellation of a driving force in a case where the second beam is

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returned to vicinity of a displacement position thereof at which the second electromechanical switch is turned off [col. 8 lines 33-46].

Claim 5, Hopcroft discloses the electromechanical switch according to claim 1, wherein at least one of a displacement of the first beam and a displacement of the second beam is based on an electrostatic force [col. 8 lines 23-32].

Claim 9, Hopcroft discloses the electromechanical switch according to claim 1, further comprising a common fixed electrode [112, 114], to which the first beam and the second beam face in parallel through an air gap [figure 1], wherein the first electromechanical switch is configured by the fixed electrode and the first beam; and wherein the second electromechanical switch is configured by the fixed electrode and the second beam. It has been held that the recitation that the element is “configured by” perform a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. In re Hutchinson, 69 USPQ 1338.

Claim 10, Hopcroft discloses the electromechanical switch according to claim 9, wherein the air gap to the fixed electrode is set to be smaller than a maximum amplitude of natural vibrations of each of the first beam and the second beam [figure 1].

Claim 12, Hopcroft discloses the electromechanical switch according to claim 1, wherein the first beam and the second beam are arranged in parallel to each other; wherein a third beam [col. 5 lines 15-20] enabled to be restored by a spring force, which is relatively weaker than the spring force of the second beam, is arranged in parallel thereto; wherein the first electromechanical switch is configured by the first beam and

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the second beam; and wherein the second electromechanical switch is configured by the second beam and the third beam. It has been held that the recitation that the element is “configured by” perform a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. In re Hutchinson, 69 USPQ 1338.

Claim 13, Hopcroft discloses the electromechanical switch according to claim 12, wherein the air gap between the second beam and each of the first beam and the third beam is formed according to a maximum amplitude of natural vibrations of the second beam [figure 1].

Claim 16, Hopcroft discloses the electromechanical switch according to claim 1, wherein the second electromechanical switch is off only for a time required by the first electromechanical switch to obtain predetermined isolation [col. 8 lines 23-32].

Claim 21, Hopcroft discloses the electromechanical switch according to claim 1, further comprising: a lower spring movable electrode [406, 408] that is configured by the first beam; a higher spring movable electrode [506, 508] that is configured by the second beam, and is arranged in parallel to the lower spring movable electrode [figure 1]; and a fixed electrode [112, 114] that is disposed to face the first beam and the second beam, wherein the first electromechanical switch includes the lower spring movable electrode including the first beam and the first fixed electrode state [col. 8 lines 23-32]; wherein the second electromechanical switch includes the higher spring movable electrode including the second beam and the first fixed electrode [col. 8 lines 33-46]; wherein the first beam and the second beams are mechanically connected to

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each other through a connecting portion [the substrate 102]; and wherein the second beam is displaced in response to displacement of the first beam [col. 8 lines 33-46].

Claims 1 and 3 are rejected under 35 U.S.C. 102(e) as being anticipated by Nelson [US 7,053,736]

Claim 1, as best understood, Nelson discloses an electromechanical switch, comprising: a first electromechanical switch [20] that is adapted to turn on and off based on a displacement of a first beam [20] which is restorable by a relatively weak spring force; and a second electromechanical switch [14] that is adapted to turn on and off based on a displacement of a second beam [14] which is restorable by a relatively strong spring force, wherein in an initial condition, the electromechanical switch is brought into an off-state in which the first electromechanical switch is off and the second electromechanical switch is on [figure 3]. It has been held that the recitation that the element is “adapted to” perform a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. In re Hutchinson, 69 USPQ 1338.

Claim 3, Nelson discloses the electromechanical switch according to claim 1, wherein in a case that both of the first electromechanical switch and the second electromechanical switch are on [figure 4], the displacement of the first beam and the displacement of the second beam are simultaneously canceled to perform a restoring operation [figure 5] so that the second electromechanical switch is turned off, thereby bring the electromechanical switch into an off-state.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hopcroft [US 6,621,387].

Claim 6, Hopcroft discloses the claimed invention except for using an electromagnetic actuation means. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use an electromagnetic actuation means instead of an electrostatic actuation means in order to create a switch with faster response time.

Claim 7, Hopcroft discloses the claimed invention except for using an piezoelectric actuation means. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a piezoelectric actuation means instead of an electrostatic actuation means in order to create a switch with a lower actuation [pull-in] voltage requirement.

Claim 8, Hopcroft discloses the claimed invention except for using a thermal actuation means. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a thermal actuation means instead of an electrostatic actuation means in order to create a switch with a higher opening force in order to prevent contact welding and improve switch opening time.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hopcroft [US 6,621,387] as applied to claim 1 above, and further in view of Potter [US 7,280,014].

Hopcroft discloses the claimed invention with the exception of placing the electromechanical switch in a housing to seal the switch from the external environment.

Potter teaches placing a Mem switch [10(1)] in a chamber [14] of the housing [12] in order to isolate the switch from the external environment [figure 1].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to place the electromechanical switch of Hopcroft in a sealed environment as shown by Potter in order to protect the electromechanical switch from external contaminants [col. 4 lines 8-14].

Allowable Subject Matter

Claims 11, 14, 17, 18-20 and 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BERNARD ROJAS whose telephone number is (571)272-1998. The examiner can normally be reached on M and W-F, 10:00-7:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Elvin G. Enad can be reached on (571) 272-1990. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Elvin G Enad/
Supervisory Patent Examiner, Art Unit 2832

Br
/Bernard Rojas/
Examiner, Art Unit 2832